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IN THE UNITED STATES DISTRICT COURT FOR THE  
NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his )  
capacity as ATTORNEY GENERAL )  
OF THE STATE OF OKLAHOMA and )  
OKLAHOMA SECRETARY OF THE )  
ENVIRONMENT C. MILES TOLBERT,) )  
in his capacity as the )  
TRUSTEE FOR NATURAL RESOURCES) )  
FOR THE STATE OF OKLAHOMA, )  
 )  
Plaintiff, )  
 )  
vs. ) 4:05-CV-00329-TCK-SAJ  
 )  
TYSON FOODS, INC., et al, )  
 )  
Defendants. )

- - - - -  
THE VIDEOTAPED DEPOSITION OF  
VALERIE HARDWOOD, PhD, produced as a witness on  
behalf of the Defendants in the above styled and  
numbered cause, taken on the 18th day of July, 2008,  
in the City of Tulsa, County of Tulsa, State of  
Oklahoma, before me, Lisa A. Steinmeyer, a Certified  
Shorthand Reporter, duly certified under and by  
virtue of the laws of the State of Oklahoma.

**TULSA FREELANCE REPORTERS**  
**918-587-2878**

1 contamination.

2 Q Okay, but in order for it to be an indicator  
3 of poultry fecal contamination, is it necessary that  
4 the PCR sequence share the same fate and transport  
5 as pathogens from poultry litter?

02:00PM

6 A Can you say that again? I just got to get the  
7 first part.

8 Q Sure. In order for it to be an indicator --  
9 you've just said it is an --

10 A Indicator of poultry fecal contamination.

02:00PM

11 Q Right, and that fecal contamination you are  
12 talking about here is bacteria; correct?

13 A Correct.

14 Q Okay. So in order for the presence of the  
15 indicator --

02:00PM

16 A I'm sorry. Let me go back there because we're  
17 not only concerned about bacterial fecal  
18 contamination from poultry, we're also concerned  
19 about nutrient contamination. So we can add  
20 nutrients and metals to that list.

02:00PM

21 Q We'll talk about -- let's table the nutrients  
22 and the metals for just a second and let's talk  
23 about bacteria. In order for it to indicate the  
24 presence of bacteria derived from poultry, is it  
25 necessary that the PCR -- that the Brevibacterium

02:00PM

1 that you identified share the fate and transport  
2 characteristics of other bacteria from poultry  
3 litter?

4 **A** It would have to have certain fate and  
5 transport characteristics in common. 02:01PM

6 **Q** Okay. If we compare the correlations that we  
7 discussed here, so the correlation, let's say,  
8 taking Enterococcus, for instance, the relationship  
9 between Enterococcus and the sequence in litter as  
10 .75 and the relationship between Enterococcus and 02:01PM  
11 the biomarker -- the sequence in water is .89, which  
12 is different; correct?

13 **A** It's different, but it's certainly within the  
14 bounds of what you would expect from regular  
15 sampling error. 02:01PM

16 **Q** Okay. How big a difference can you have  
17 within the bounds of regular sampling error?

18 **A** In environmental microbiology we're very happy  
19 to get correlations of .3 as long as they're  
20 statistically significant, even .2 sometimes. So 02:01PM  
21 there's a really wide range of what you can get from  
22 correlations and still be biologically meaningful.

23 **Q** Okay. So does it surprise you at all then  
24 that the correlation that you got between E. coli  
25 and the PCR sequence in litter was .39 you told me 02:02PM